COMPARATIVE EFFECT OF YOGIC PRACTICES ON PHYSIOLOGICAL AND PSYCHOLOGICAL VARIABLES OF DRUG ADDICTS

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CERTIFICATE

I hereby declare that the short synopsis **"Comparative Effect of Yogic Practices on Physiological and Psychological Variables of Drug Addicts"** being submitted in partial fulfilment of the requirement for the degree of Doctor of Philosophy in Yoga under Department of Yogic Sciences of Lakshmibai National Institute of Physical Education, Gwalior (M.P.) year 2021- 2022. It is a bonafide record of original work carried out under the supervision of Dr. Manoj Sahu & Dr. Kuntal Ghosh and has not been submitted in full or part to any other university or institute for a degree or diploma.

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ABSTRACT

Drug addiction is a global health issue significantly affecting physical, psychological, and social well-being. With its origins rooted deeply in Indian culture, Yoga has emerged as a complementary approach promoting holistic healing through improved physical and mental health. Given the rising prevalence of substance use disorders, particularly among men aged 25–50 years, exploring effective adjunct treatments such as yoga is critical. This research aims to examine and compare the effects of specific yogic practices on psychological happiness, self-esteem and physiological variables Body Mass Index, heart rate, blood pressure among drug addicts. The study specifically focuses on male individuals undergoing rehabilitation in Himachal Pradesh, India. Sixty male drug addicts aged between 25 and 50 years, selected randomly from a rehabilitation center in Shimla, Himachal Pradesh. Participants were divided into four distinct groups: Asana group, Pranayama group, combined Asana and Pranayama group, and a control group. The study implemented a structured 12-week yoga intervention, conducted three days per week, with sessions lasting 30 minutes each. Psychological variables were assessed using standardized questionnaires the Oxford Happiness Questionnaire and the Rosenberg Self-esteem Scale. Physiological variables were evaluated through standardized measurements: BMI, heart rate, and blood pressure. Data were collected at baseline, after 12 weeks, and after 6 weeks to evaluate sustained effects. It was hypothesized that there would be no significant difference in psychological and physiological variables across the experimental and control groups after the intervention. Descriptive statistics, dependent t-tests, and ANCOVA were employed for data analysis, with a significance level set at 0.05. The study is significant as it potentially demonstrates the beneficial effects of yoga as an adjunct therapy for drug rehabilitation. Positive outcomes may influence medical practitioners to incorporate yogic practices into treatment protocols, thereby enhancing recovery processes and contributing valuable insights into addiction rehabilitation literature.

Keywords: Asana, Pranayama, Physiological Variables, Psychological Variables.

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INTRODUCTION

Research on yoga is flourishing day by day. A lot of research have been done on yoga and is still going on because of its usefulness. Researchers have found significant positive effect of yoga in most of the researches. Some studies have investigated in depth with multiple variables and shown supportive results.

The Yoga is one of the oldest sciences of the world originated from India, which is very useful for maintaining the physical, mental and moral health. Yoga is a most ancient education based on higher Philosophical knowledge and a spiritual concept of man, for the overall and harmonious growth of the body as well as of mind. Yoga helps the human being to give his best through his intellectual, moral, spiritual, and physical activities. The regular practice of Yoga asanas, Yogic kriyas, Pranayama, Bandha's, Meditation etc. calm down the whole system of our body. Yoga (science of self-realization) offer therapies and practices to bring about and maintain lasting sobriety from drug and alcohol addiction. Drug addiction or substance abusers have been a social menace for the worldwide. There are various reasons by which drug addiction related problems cannot be done away completely by any country.

National agencies like Indian Council for Medical Research (ICMR), Indian Council of Social Science Research (ICSSR), Department of Biotechnology (DBT), Department Of Science & Technology (DST), private sector and international agencies like World Health Organisation (WHO) and other United Nations (UN) agencies should dedicate and enhance research funds for mental and substance use disorders.(Ross et al., 2013).

The East and South-East Asia region faces a major challenge in the continued illicit manufacture of, trafficking in and use of synthetic drugs. Increases in the manufacture of and trafficking in ketamine have been observed, elevated levels of MDMA have been found in some "ecstasy" tablets, and several new and highly potent synthetic drugs have emerged, posing serious public health challenges. From 1 July 2021, China started to control synthetic cannabinoids using a generic definition. Controlling groups of substances in this manner, also known as the "generic approach", enables countries to control many substances at once without necessarily having to name them individually in the legislation. This approach also makes it possible to anticipate controls on new substances that may arise. In 2019, China introduced similar controls over fentanyl-related substances.(*Annual Report 2021*, n.d.)

The “Drug addiction is a chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences” (National Institute on Drug Abuse, 2014) (Abuse, --). Over the last decade, drug abuse has become a menace affecting millions of youths and children in our nation. States like Mizoram, Goa, Manipur, and Punjab has been facing this epidemic over a long period of time. In Punjab, the total number of drug users is 2,32,856 out of which, 99% are male. (Drug Addiction in India: The Government’s Survey in Punjab and Delhi - Government, n.d.). It is presently a social evil that wrecks the health and lives of the drug addicts. The word addiction is a compulsion and dependence that can occur in relation to any substance or behaviour. Substance abuse had spread epidemically in the 21st century. “Substance abuse refers to the harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs. Psychoactive substance use can lead to dependence syndrome a cluster of behavioural, cognitive and physiological phenomena that develop after repeated substance use and that typically include a strong desire to take the drug, difficulties in controlling its use and persisting in its use despite harmful consequences.”(*404*, n.d.). A total of 190 million people all over the world consume one or the other form of drug (Miller & Sanchez, 1993).

As per the 2010 reports of United Nation Office on Drug and Crime “Approximately 5% of the global population used an illicit drug”. There are about 2.5 million death per year, while death toll due to cocaine, heroin and other drug is 0.1 to 0.2 million per year. Besides death illicit drug abuse raises morbidity rate and puts tremendous pressure on society for treating it”. Further, there is 200-250 billion-dollar expenditure in treating drug abuse (United Nations Office on Drugs and Crime [UNODC], 2010). As per World Drug Report 2017 globally, premature deaths due to drugs are estimated to be 190,000, out of that majority is attributable to the opioids use. The menace of drug abuse in Punjab is worse than the rest of the country.

PROBLEM STATEMENT

The statement of the problem is stated as **“Comparative Effect of Yogic Practices on Physiological and Psychological Variables of Drug Addicts”.**

OBJECTIVES OF THE STUDY

1. To characterize the level of Psychological Variables (Happiness and self-esteem) of Asana, Pranayama, Asana + Pranayama and Control Group of Drug Addict Persons of Himachal Pradesh State.
2. To characterize the level of Physiological Variables (Body Mass Index (BMI), Heart Rate and Blood Pressure) of Asana, Pranayama and Control Group of Drug Addict Persons of Himachal Pradesh State.
3. To compare pre-test post-test mean scores Psychological and Physiological Variables Asana, Pranayama, Asana + Pranayama and Control Group of Drug Addict Persons of Himachal Pradesh State.
4. To compare adjusted mean scores of Psychological Variables (Happiness and self-esteem) Asana, Pranayama, Asana + Pranayama and Control Group of Drug Addict Persons of Himachal Pradesh State by considering their Pre-Psychological Variables (Happiness and self-esteem) as covariate.
5. To compare adjusted mean scores of Physiological Variables (Body Mass Index (BMI), Heart Rate and Blood Pressure) of Asana, Pranayama, and Control Group of Drug Addict Persons of Himachal Pradesh State by considering their Pre-Physiological Variables (Body Mass Index (BMI), Heart Rate and Blood Pressure) as covariate.

HYPOTHESES

- There will be no significant difference between the pre-test and post-test mean scores of selected psychological and physiological variables among drug addict persons in Himachal Pradesh State.
- There will be no significant difference between the adjusted mean scores of psychological variables (happiness and self-esteem) among the Asana, Pranayama, and Control groups of drug addict persons in Himachal Pradesh State, considering their pre-test psychological variables (happiness and self-esteem) as covariates.
- There will be no significant difference between the adjusted mean scores of physiological variables (body mass index, heart rate, and blood pressure) among the Asana, Pranayama, Asana + Pranayama, and Control groups of drug addict persons in Himachal Pradesh State, considering their pre-test physiological variables (body mass index, heart rate, and blood pressure) as covariates.

DELIMITATIONS

- The study will be delimited to the male subjects.
- The age of the subject will range from 25 to 50 years.
- The study will be delimited to the persons who are undergoing substance using disorders.
- The study will be delimited to the selected yogic practices.
- The study will be delimited to the persons who were took at least two types of drugs.
- The study will be delimited to the selected psychological and physiological variables.

Significance of the Study

The study may be significant in the following ways-

- The study will help in determining the effect of selected yogic practices on the drug addict's status.
- The study will also help the medical practitioners to prescribe the yogic practices.
- The findings of the study will add to existing literature of yoga practices and drug rehabilitation.
- The study will provide knowledge about yoga, yogic practices, drugs, and drug rehabilitation process.
- This research study will spread awareness about the benefits of Yogic interventions on the psychological and physiological variables.

LITERATURE REVIEW

(Mohamed et al., 2020) conducted a study on assessment of anxiety and depression among substance use disorders patients.

The study included 100 SUD patients and 50 healthy controls; 73% live in rural areas and 27% in urban ones. Their mean age was 28.1 years (SD = 6.5). Most of the patients were married (62%) while 38% were singles. Most of the patients were graduates of either secondary school or its equivalent (67%) or held a university degree (23%). Fourteen percent of them have no job apart from the domestic affairs, and the rest are either employed (20%),

manual workers (52%), or students (10%). Most of the participants in this study belonged to the moderate socioeconomic status group (52%), while 22% belong to the low socioeconomic class and 26% were in the high socioeconomic class. A comparison between sociodemographic data shows no statistically significant difference between the SUD patients and healthy controls ($p = 0.643$)

(Reddy et al., 2014) This investigation analysed data from a pilot randomized controlled trial comparing a 12-session yoga intervention with an assessment control for women aged 18 to 65 years with posttraumatic stress disorder (PTSD). The Alcohol Use Disorder Identification Test (AUDIT) and Drug Use Disorder Identification Test (DUDIT) were administered at baseline, after the intervention, and a 1-month follow-up. Linear mixed models were used to test the significance of the change in AUDIT and DUDIT scores over time. Treatment-seeking questions were compared by using Fisher exact tests.

The mean AUDIT and DUDIT scores decreased in the yoga group; in the control group, mean AUDIT score increased while mean DUDIT score remained stable. In the linear mixed models, the change in AUDIT and DUDIT scores over time did not differ significantly by group. Most yoga group participants reported a reduction in symptoms and improved symptom management. All participants expressed interest in psychotherapy for PTSD, although only two participants, both in the yoga group, initiated therapy.

Results from this pilot study suggest that a specialized yoga therapy may play a role in attenuating the symptoms of PTSD, reducing risk of alcohol and drug use, and promoting interest in evidence-based psychotherapy. Further research is needed to confirm and evaluate the strength of these effects.

(Kuppili et al., 2018) Substance use disorder are comparable to chronic medical illnesses and have a chronic relapsing course. Despite being significant contributes to morbidity and mortality, limited treatment options exist. The current narrative review was aimed at providing an overview of yoga therapy in substance-use disorders and discuss the relevant methodological issues. Article published in English language till May 2017 indexed with PubMed, PubMed central, and google scholar were searched using search items “Yoga,” “Substance Use,” “Drug Dependence,” “Nicotine,” “Tobacco,” “Alcohol,” “opioid,” “Cannabis,” “Cocaine,” for inclusion in the review. A total of 314 studies were found fulfilling the stated criteria. Out of which, 16 were found the fulfil the inclusion and exclusion criteria and 12 were randomized control trials. Most of the studies were available

on the role of yoga in management of nicotine dependence. Sample size of these studies ranged from 18 to 624. Most of the studies suggested the role of yoga in reducing substance use disorder as well as substance-related craving (especially in nicotine-use disorders) in short term. However, more studies required for the demonstrating the long-term effects of yoga therapy in substance-use disorders.

(Fitzgerald et al., 2021) Mind Body Connect (MBC) is a charity which uses therapeutic yoga as a vehicle of change for marginalized populations. Alongside MBC, Sheffield Hallam University's SHU Strength researchers carried out this study aiming to: (1) Gauge the impact of therapeutic yoga classes upon the mood state of people with a Substance Use Disorder (SUD) and (2) Explore the perceived benefits of therapeutic yoga class participation. An adapted shortened Profile of Mood States (POMS) was completed before and after each yoga class. A comparison of means with paired sample T-Test and Cohen's D was then carried out. Participants who attended 6+ classes were interviewed. Findings were then converged before and after measurements of anger, sadness, tiredness, worry, confusion, energy, and relaxation were taken, Classes were held at SHU for service users from a Phoenix Future's (PF) rehabilitation centre. A single yoga class significantly relaxed participants and reduced negative mood states. Interview data covered a range of perceived benefits including the use of yogic down-regulation techniques as daily coping strategies. The MBC yoga programme appears beneficial as an adjunctive therapy for PF residents.

(Frontiers | Long-Term Effects of Mind-Body Exercises on the Physical Fitness and Quality of Life of Individuals with Substance Use Disorder—A Randomized Trial | Psychiatry, n.d.) Mind-body exercises (MBE) are sequences of low to medium-intensity activities that benefit healthy performers physically and mentally. In contrast to the unmodified application of traditional tai chi, qi gong, or yoga in the healthy population, MBEs are typically tailored for individuals with substance abuse disorder (SUD). Despite numerous applications in practice, the detailed effects of tailor-made MBEs for SUD are unclear.

A total of 100 subjects obtained from the Shanghai Mandatory Detoxification and Rehabilitation Center with SUD were randomly assigned into two groups. The subjects in the experimental group (n = 50) practiced tailored MBE for 60 min a day, five times a week, for 3 months. The subjects (n = 50) in the control group were treated with conventional rehabilitation exercises with the same intervention protocol. The outcomes of fitness and

quality of life for drug addiction were measured at the beginning and after 3 and 6 months by a questionnaire (QOL-DA). A two-way repeated measure analysis of variance was applied to compare the difference of treatments in the two groups.

Statistically significant differences for the experimental group were found in systolic ($p < 0.01$, $\eta^2 = 0.124$) and diastolic blood pressure ($p < 0.01$, $\eta^2 = 0.097$), pulse ($p < 0.01$, $\eta^2 = 0.086$), vital capacity ($p < 0.05$, $\eta^2 = 0.036$), flexibility ($p < 0.01$, $\eta^2 = 0.143$), and aerobic endurance ($p < 0.01$, $\eta^2 = 0.165$). Results of the QOL-DA showed statistically significant differences between the experimental and control groups in total score ($p < 0.01$, $\eta^2 = 0.158$) with greater effects on the former.

(Brooks et al., 2021) In this study, they suggested that yoga may be an effective adjunct intervention for the substance use disorder (SUD). Additionally, women with SUD require different treatment approaches than men. The primary objective of this study was to critically evaluate the evidence for the effectiveness of yoga, specifically for women, as part of treatment for SUD. Nine electronic databases were searched from inception to January 2020. Randomized controlled trials (RCT) that evaluated any type of yoga, including yoga as a component of mindfulness-based treatment, against any type of control in individuals with any type of addiction were eligible. Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Checklist and Statement, methodological quality was appraised using Physiotherapy Evidence Database (PE Dro) criteria. Ten RCTs (eight mixed-gender and two female-focused) met the eligibility criteria. Most of these RCTs were small to medium-sized, with various methodological and analytical flaws and deficits. The types of addictions included in these studies were alcohol, drug, and nicotine addiction. Most RCTs suggested that various types of yoga, primarily Hatha Yoga and its components, led to favourable or equivalent results for SUD as an adjunct to control or treatment-as-usual interventions. There are limited results on the impact of yoga for SUD specifically focused on women and their unique needs. Although the results of mixed-gender articles are encouraging, large RCTs with gender-specific sub analyses are required to better determine the benefits specific to women incorporating yoga for SUD.

RESEARCH METHODOLOGY

The study will include 60 male participants who will be undergoing treatment at a drug rehabilitation center in Shimla, Himachal Pradesh. To ensure unbiased group distribution, randomization will be applied in accordance with recommendations for small-sample

experimental studies (Kang et al., 2008). Participants will be evenly divided into four groups of 15 individuals each: the Asana Group, the Pranayama Group, the combined Asana and Pranayama Group, and a Control Group. Designed as a randomized controlled trial, the study will aim to enhance the reliability and validity of the results. The intervention will be carried out over a 12-week period, with participants attending three sessions per week, each lasting approximately 30 minutes. The Asana group will engage in a structured sequence of physical postures, while the Pranayama group will practice specific breathing techniques. The third group will combine both Asana and Pranayama for a more integrated, holistic experience. In contrast, the control group will not receive any yoga-based intervention and will continue with the routine rehabilitation procedures provided by the center. This carefully structured design will enable a thorough assessment of the effects of yogic practices on both psychological and physiological outcomes.

SELECTION OF VARIABLES

Type of Variable	Variables
Dependent Variables	**Psychological Variables**
	1. Happiness
	2. Self-esteem
	Physiological Variables
	1. Body Mass Index (BMI)
	2. Heart Rate
	3. Blood Pressure:
	• Systolic Blood Pressure
	• Diastolic Blood Pressure
Independent Variables	Asana
	Pranayama
	Asana and Pranayama

CRITERION MEASURES

Happiness

The happiness will be measured by using the Oxford Happiness Questionnaire developed by the psychologist Michael Argyle and Peter Hills (2002), of Oxford University.

The questionnaire comprises of total 29 questions. Each statement will be assessed by the 6 likart scale namely 1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = slightly disagree, 4 = slightly agree, 5 = moderately agree, 6 = strongly agree which indicates that how much one agreed or disagreed with each by entering a number in the blank after each statement. The item – 2,3,4,7,8,9,11,12,15,16,17,18,20,21,22,25,26 are positives and the items – 1,5,6,10,13,14,19,23,24,27,28,29 are negatives. The lowest possible score is 1 and the highest possible score is 6 (the average score is 4.30).

Self Esteem

Self-esteem is measured using tools like the Rosenberg Self-Esteem Scale, which includes 10 statements rated on agreement. The total score indicates whether a person has low, moderate, or high self-esteem based on their self-perception.

Heart Rate

Resting Heart Rate will be measured with the help of the Digital Machine, and it is measured in beats per minute (Beats/min).

Blood Pressure

Blood pressure will be measured with the help of the Automatic Digital Measuring Machine, and it is measured in mmHg.

Body Mass Index (BMI)

- Height- The subjects will be stands erect position on the floor of the stadiometer with his back to the vertical backboard of the stadiometer. The body mass of the subject will be equally distributed on both feet. The heels of both feet will place together on the vertical board with touching the base. Measurement is taken at the end of a deep inward breath.

- Weight- Digital weighing machine and score sheet is required to measure the weight of the subjects. There must be minimum clothing on the body and shoes will remove during the administration of the test for the best accuracy. The reading scale must be zero before using the machine. The subjects stand on the centre of the scale without any support and equally distributed body weight on both feet.

- Body Mass Index (BMI) - The body mass index of the subjects will calculate by the body mass divided by the square of the body height, and is expressed in units of kg/m^2, resulting from mass in kilograms and height in meters.

DATA COLLECTION

Data will be collected at baseline (pre-test) and at the end of the twelve-week intervention (post-test). At each stage, both psychological and physiological variables will be measured to track progress and assess the effects of the yoga interventions.

STATSTICAL TECHNIQUE

Descriptive Statistics, Dependent T- test, ANCOVA will be used.

EXPECTED OUTCOMES

This study aims to evaluate the effectiveness of yogic interventions- asana, pranayama, and their combination- in the rehabilitation of individuals with substance use disorders. The expected outcomes are as follows:

1. Psychological Improvements

Participants undergoing yoga interventions are expected to show significant improvements in:

a) Self-esteem and subjective well-being
b) Reductions in anxiety, depression, and emotional distress

The asana + pranayama group is hypothesized to yield the greatest psychological benefits due to enhanced psychophysiological regulation.

2. Physiological Enhancements

Improvements are anticipated in key health indicators:

a) BMI
b) Resting Heart Rate
c) Blood Pressure

These reflect enhanced cardiovascular, autonomic, and metabolic function, which are often impaired in individuals with substance dependence.

3. Comparative Efficacy

The study will assess the relative effectiveness of asana, pranayama, and their combination. It is expected that the combined group will show superior outcomes due to synergistic mind-body integration.

4. Statistical Validation

Using ANCOVA and T-tests, pre- and post-intervention data will be analyzed to ensure statistical significance and validate the effectiveness of the interventions.

5. Long-Term Impact

Yoga is expected to aid in relapse prevention by enhancing self-regulation, emotional resilience, and mindfulness, contributing to sustained recovery.

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